considered to be closely related to the action of estrogen (e.g., genes for p300/CBP, ACTR, RIP 140, TIF2, PDGF receptor and VEGF receptor) by stimulation with E_2 was observed as shown in Table 5, although little is known about the pathway, the mechanism or the like. The treatment with DES, which causes endocrine disruption, for 24 hours activated almost all of the genes other than c-Myc. Suppression of the expression of the genes for N-CoR/SMRT and ARA 70 (nuclear receptor or nuclear receptor transcriptional coupling), p38 gamma (data not shown) and JNK2 (kinase-type signal transduction), and PDGF receptor (receptor-type kinase) was observed for the treatment with DES for 2 hours. On the other hand, the treatment with BisA, which is suspected to have an endocrine disrupting activity, for 2 hours suppressed the expression of the genes for ACTR (nuclear receptor or nuclear receptor transcriptional coupling) and VEGF receptor (receptor-type kinase). The influence by the treatment with BisA on the genes was considered to be less than that observed for the stimulation with DES. The treatment with BisA for 24 hours suppressed the expression of the genes for JNK2 and BMK2 (kinase-type signal transduction), and VEGF receptor (receptor-type kinase). Thus, control of gene expression by BisA treatment in a manner different from that observed for the stimulation with DES was observed. As described

above, the use of the chip of the present invention provides a method in which significant variation of signals for expression depending on the substances used for treatment and the length of treatment time is observed. A gene that is influenced by an endocrine disruptor, in particular, of which the expression is suppressed by an endocrine disruptor, could be clearly detected.

Industrial Applicability

As described above, the method of the present invention is excellently effective in that it can detect a number of genes that are influenced by endocrine disruptors simultaneously, in vitro, rapidly and with high sensitivity. Furthermore, the present invention provides a DNA array which can be used to detect genes that are influenced by endocrine disruptors rapidly and with high sensitivity. The method of the present invention is also useful for detecting a gene involved in a previously unknown signal transduction pathway. In addition, the present invention is excellently effective in that the presence or the absence of an endocrine disruptor or a substance that potentially causes endocrine disruption can be judged using the expression of a number of genes that are influenced by endocrine disruptors obtained according to the method of the present invention as an index.

Sequence Listing Free Text

SEQ ID NO:1: Designed oligonucleotide primer to amplify Smad3 mRNA.

SEQ ID NO:2: Designed oligonucleotide primer to amplify Smad3 mRNA.

SEQ ID NO:3: Designed oligonucleotide primer to amplify VEGF receptor mRNA.

SEQ ID NO:4: Designed oligonucleotide primer to amplify VEGF receptor mRNA.

SEQ ID NO:5: Designed oligonucleotide primer to amplify ACTR mRNA.

SEQ ID NO:6: Designed oligonucleotide primer to amplify ACTR mRNA.

SEQ ID NO:7: Designed oligonucleotide primer to amplify N-CoR/SMRT mRNA.

SEQ ID NO:8: Designed oligonucleotide primer to amplify N-CoR/SMRT mRNA.

SEQ ID NO:9: Designed oligonucleotide primer to amplify efp mRNA.

SEQ ID NO:10: Designed oligonucleotide primer to amplify efp mRNA.

SEQ ID NO:11: Designed oligonucleotide primer to amplify c-Myc-1 mRNA.

SEQ ID NO:12: Designed oligonucleotide primer to